REMARKS

Claims 1-20 were originally filed in the present application.

New Claim 21 is added by this amendment.

Applicant respectfully avers that all pending Claims are now in condition for allowance and the same is respectfully requested.

Claim Rejection Under 35 USC 103:

The Examiner rejects Claims 1-3, 5-6, 9-16 and 19-20 under 35 USC 103(a) as being unpatentable over Winkelman (USP 5,668,890) in view of Primerano (USP 6,885,380) and Cok (USP 6,903,378).

Claim 1:

With regard to Claim 1, the Examiner finds that Winkelman discloses:

[a] system for converting input image data in a first color space to output image data in a second color space (e.g. converter 10; col. 5, line 57 to col. 6, line 22):

a converter for calculating chroma/luma values and calculating hue angle of said input image data from a first color space; (see col. 6, lines 24-41)

a matrix multiply unit, said unit multiplying the input data with a conversion matrix selected (see col. 29, lines 25-51).

The Examiner notes, however, that Winkelman differs from Claim 1 in that Winkelman does not explicitly teach RGBW format and a triangle calculator that determines in which chromaticity triangle the input data resides.

However, the Examiner finds that Primerano discloses a triangle calculator that determines in which chromaticity triangle the input data resides (see col. 4, lines 44-53) and that Cok discloses converting RGB to RGBW format (see col. 5, lines 25-38).

Thus, the Examiner concludes, it would have been obvious to have modified Winkelman to include RGBW format converter (as taught by Cok) and a triangle calculator (as taught by Primerano).

As to the current rejection to Claim 1, Applicant respectfully traverses.

Pursuant to the MPEP references (2141 et seq.) with regards to prima facie rejections for obviousness that were promulgated in light of the Supreme Court's KSR case, it is case that the claimed invention must be considered "as a whole" – as opposed to obvious on a limitation by limitation basis.

Additionally, while Section 2141 now states that while "[t]he prior art reference[s] need not teach or suggest all of the claim limitations", there still is a need for the Examiner to explain the differences between the prior art and the claimed invention.

In this case, however, Applicant respectfully avers that the prior art that the Examiner has supplied to support a prima facie rejection under 103 – not only does not teach all of the claimed limitations of Claim 1 – but that the prior art does not perform as the Examiner posits.

For merely one example, the Examiner states that Primerano teaches the use of a triangle calculator to determine in which triangle region a given input image data resides. To support the Examiner's assertion, the Examiner cites Primerano at column 4, lines 44-53.

Applicant reproduces this language from Primerano below for the convenience of the Examiner:

> "FIG. 1 shows a 1931 CIE chromaticity diagram displaying hypothetical representations of the primaries of the four-color OLED display device. The red primary 2, green primary 4, and blue primary 6 define a color gamut, bounded by the gamut defining triangle 8. The additional primary 10 is substantially white, because it is near the center of the diagram in this example, but it is not necessarily at the white point of the display. An alternative additional primary 12 is shown, outside the gamut 8, the use of which will be described later." (Primerano, col. 4, lines 44-53).

Applicant notes that nothing in that excerpt from Primarano discloses or describes a triangle calculator (or any region apart from a triangle, for that matter) to determine a chromaticity region in which to help the system select a conversion matrix to then perform the conversion. In fact, Primerano merely shows the Fig 1 as the standard CIE chromaticity chart, as is well known in the art. Primerano does allude to an additional primary (12) that is outside the gamut 8; but the use of such an additional primary is used for the purpose of "normalization" -- which "allow[s] for accurate reproduction of colors within the gamut of the display device". See Primerano at column 8, line 37 to column 9, line 57.

For another example, neither Winkelman in combination with Primerano and Cok disclose a matrix multiply unit that selects a conversion matrix (among a plurality) that is based upon the chromaticity region in which the input image data resides.

The Examiner cites Winkelman for this limitation at column 29, lines 25-51 – and Applicant reproduces this language below for the convenience of the Examiner:

> "In a method step (A), an approximated conversion table for the input color converter 7 is produced and is stored in a table memory 32 of the input color converter 7. The functionally corresponding color values L*.sub.j (s), a*.sub.j (s), and b*.sub.j (s) of the independent CIELAB color space (15) are approximately calculated from color values R, G, and B of the RGB color space 14, taking the spectral and electrical properties of the color image scanner 1 into consideration. The metamerism problems arising due to different color pigments can thereby be simultaneously

taken into consideration. The approximate calculation of the color values L*.sub.j (s), a*.sub.j (s), and b*.sub.j (s) of the conversion table is implemented in the following steps.

In a first step (A.sub.1), the potentially pre-distorted color values R, G, and B of the color image scanner (1) are linearized according to equation [1]. . . .

In a second step (A.sub.2), the color values R, G, and B are matricized according to equation [2] into the corresponding standard color values X, Y, and Z with the assistance of matrix coefficients (M): . . .

In a third step (A.sub.3), the standard color values X, Y, and Z are standardized according to equation [3], taking the type of illumination light (reference white) into consideration. . . .

In a fourth step (A.sub.4), the standard color values X, Y, and Z are then transformed into the color values L*, a*, and b* of the communication color space 15 according to equation [4]. . . .

In a fifth step (A.sub.5), finally the color values L*, a*, and b*, are quantized according to equation [5], . . .

and the quantized color values (L*, a*, b*) are stored in the table memory 26 of the input color converter 7." (Winkelman at col. 29, lines 25-67)

As may be seen from the above excerpt of Winkelman, the conversion from RGB color space is accomplished by matrix M in the "second step". Nowhere does Winkelman teach that matrix M is selected from among a plurality of such matrices

whose selection is determined by a chromaticity region calculator that determines where the input image data resides.

In fact, Winkelman discloses at column 30, line 62 to column 31, line 55 that matrix M is one that "can occur on the basis of adaptive calculation" that takes into consideration the particular spectral functions of the "scanner unit" – but does not disclose the use of chromaticity regions of the input image data.

Of course, these limitations of Claim 1 add up to comprise a system that improves upon the known techniques of gamut mapping to provide an "inexpensive hardware and software implementations" (see Abstract). As is described in the specification, the chromaticity triangle (or other regions for that matter) may be used to advantageously to "select one of the multi-primary matrices". (Specification at paragraph 0051).

Thus, even though the Examiner states that the combination of Winkelman, Primerano and Cok show the advantages of "sav[ing] energy power when image data RGB [is] transferr[ed] to RGBW format", Applicant avers that the present invention of Claim 1 in addition performs an inexpensive implementation of gamut mapping with such a chromaticity region calculator – which is not met by the combination of record.

As the combination of Winkelman, Primerano and Cok, either singly or in combination, do not disclose such a system, Applicant respectfully avers that the prima facie rejection based on this combination is not correct. Although, after KSR, not all limitations need be disclosed in the prior art references, Applicant respectfully submits that the teachings that the Examiner relies upon do not make obvious the claimed invention of Claim 1 – when properly viewed as a whole.

Applicant respectfully requests that the present rejection to Claim 1 be removed and that Claim 1 be moved through to allowance.

Claims 2 through 10:

As Claims 2 through 10 ultimately depend from allowable Claim 1, Applicant respectfully requests that Claims 2-10 also be moved through to allowance.

Claims 11 through 20:

As the Examiner essentially applies the same rejection to Claims 11 through 20 as corresponding to Claims 1 through 10 above, Applicant respectfully avers that the same arguments for Claims 1 through 10 apply with same force to Claims 11 through 20.

As such, Applicant respectfully requests that Claims 11-20 be moved through to allowance.

Conclusion

The undersigned respectfully submits that, in view of the amendments to the claims made herein, the present application is believed to be in condition for allowance. It is respectfully requested that this application be reconsidered and passed to issue.

If the Examiner believes a telephone conference would expedite the allowance of the claims, the Examiner is invited to contact Stuart P. Kaler at (408) 200-7387.

Respectfully submitted,

/Stuart P. Kaler/

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